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AUTHOR Epstein, Louis E.; Lynch, William W.
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ABSTRACT

A study of 70 educable mentally retarded children (9- to 13-years-old) was conducted to examine the effects of special class teachers' use of an attentional cueing technique in response to oral reading errors. During oral reading lessons, errors were recorded under conditions in which the teacher was either instructed to make her normal responses to oral reading errors (control group) or use the five-step attentional cueing technique (experimental group). In comparison to controls using single- or multiple-cue responses to pupil errors, findings showed a significant error difference in favor of the experimental condition. Evidence suggested that mildly retarded children learn more new words from teacher responses to oral reading errors which provide a highly consistent, structured, attentional form of feedback than from teacher responses incorporating the normal variety of cueing behaviors. Study limitations included deviations from normal teaching patterns and the relatively small sample. (Provided are tables illustrating statistical data and appendixes containing information on lesson materials and the five-step cueing technique.) (SB)

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INTERACTIVE TEACHING SKILLS

AN EXPERIMENTAL TEST OF AN ATTENTIONAL CUEING TECHNIQUE IN AIDING MILDLY RETARDED CHILDREN'S RECALL OF READING VOCABULARY

LOUIS E. EPSTEIN

AND

WILLIAM W. LYNCH

FINAL REPORT 29.32

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cith CENTER FOR INNOVATION IN TEACHING THE HANDICAPPED
School of Education Indiana University Bloomington

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An Experimental Test of an Attentional Cueing Technique in Aiding Mildly Retarded Children's Recall of Reading Vocabulary

Louis E. Epstein and William W. Lynch
Center for Innovation in Teaching the Handicapped
Indiana University

This is a report of an experiment conducted to examine the effects of special class teachers' use of an attentional cueing technique in response to oral reading errors made by educable mentally retarded children. The study is one of a series of experiments carried out at this Center under the general project title, "The Development of Cognitive Demand Skills of Teachers of the Handicapped." The goal of these studies is to identify cognitively oriented interactive skills of teachers that have promise for enhancing the classroom success of mildly handicapped children. In planning and designing this series of experiments, the assumption has been made that, while there are undoubtedly general teaching skills, effective interactive skill patterns of teachers tend to be task- and content-specific. For example, a cueing strategy used to assist children in correcting oral reading errors and improve retention of new words is necessarily quite different from the strategy used by a teacher to aid students' arithmetic problem-solving behavior or teacher social studies concepts. Reading is a critical experience in the elementary school years, particularly for those children who are mildly handicapped or who run a high risk of eventually becoming labeled as handicapped ("mentally retarded," "learning disabled," etc.) In most school programs, reading constitutes the single most

important area of instruction during the primary grades. Its crucial role can be judged by the proportion of instructional time spent on it, the importance attached to it by teachers, and the role played by it in determining whether or not a child is evaluated as succeeding or failing in school. For those children whose history of early school failure and assessed deficiencies has led to special class placement, reading continues to be critical. Reading looms large in the curriculum of the special class, and successful achievement in reading is probably the single most important factor in determining whether or not a child returns to the mainstream of the regular school program.

The teacher is the key to a child's success in reading. While enormous investments have been made to improve curriculum materials and use modern technology in reading instruction, the teacher's skill in reading instruction is the most critical factor for most children. Teacher skill has several components--diagnostic skill; planning, selection, and construction of instructional materials; classroom organization and management; and the many forms of direct verbal interaction with pupils during reading instruction. Of these skills, the interactive are the least understood and most neglected in the education of teachers. The present investigation was an attempt to focus on one aspect of the interactive teaching of reading. The investigation consisted of three phases: preliminary observation and analysis, critical review of research, and the experiment itself.

Background of the Experiment

Previous studies have suggested wide variability among teachers in the way in which the interactive aspects of reading instruction are carried out. Lynch and Ames (1972), in year-long observational studies of both special and regular classes, found wide variations in style of reading instruction. These variations were reflected in the level of "cognitive demands" (questions) to individual children, the types of feedback given to children, and the distribution of response opportunities among individual children. Guzak (1967) concluded from an observational study that, according to reading objectives commonly considered desirable, teacher questions during reading tended to be inappropriate. Della-Piana and Endo (1973), in their review of reading research, evaluated the newer, personalized, objectives-based programs (such as PLAN, Individualized Prescribed Instruction, McGraw-Hill Programmed Reading, etc.). They showed that a considerable portion of the variance in the performance of pupils using the same program in different classes was attributable to teacher differences. Niedermeyer (1970) reported that systematic observation of teachers in criterion-referenced instructional programs revealed anticipated outcomes of particular lessons frequently did not coincide with pupil responses. Some pupils (40 percent) never made an individual response, and teachers commonly provided inappropriate feedback sequences or inappropriate reinforcement.

In preparing for the present study, the investigators observed representative classes of EMR children during reading instruction and reviewed videotapes of special class reading groups made during

previous studies. Two goals guided this preliminary observation. First, an attempt was made to identify the most common types of teacher-pupil interactive activity during reading. Second, a record was made of the types of interactive moves made by the teachers during reading instruction.

It soon became clear that the reading group was the most common form of organization for reading instruction in special classes. Typically, teachers divided the class into three or four groups. The teacher usually based the assessment of reading level on the level book in a reading series that each child had completed. During reading group activity, the teacher's role included reviewing sight words, reviewing and discussing the stories, giving workbook assignments, and conducting oral reading by having children take turns reading sections of a story from the basal reader. The latter was one of the most common activities, occupying a major portion of reading group instruction in many classes. Teachers also devoted time to individual work with children, going over stories, instructing in word-attack skills, etc. Here too, oral reading occurred frequently.

Because of the frequency of oral reading activities, either in group instruction or individual tutorial work, it was decided to focus on the interactive processes used in these activities. It soon became apparent that a teacher's response to miscues, nonresponses, and other difficulties encountered by the child in reading aloud was a critical feature of the interaction. It appeared that teachers were using miscues and nonresponses as opportunities to instruct the

children. Frequently, the teacher would question or encourage the child to respond to a missed word in such a way that the child would eventually identify the word by himself. For example, a teacher frequently encouraged a child to scund out a word or to apply a phonic rule.

Eventually, the investigators developed a set of observation categories to use in recording and classifying teacher cues to oral reading errors and nonresponses during oral reading. These categories are presented in Table 1.

As teacher cueing behavior during oral reading was observed, the investigators were impressed with the variability of the techniques used. They were also impressed with the apparently dysfunctional nature of many cueing responses. Frequently, the teacher's response did not seem to provide the child with any guidance at all in coping with the difficult word (e.g., "You're not trying!"). Teachers were also frequently observed taking a child through a fairly complicated cueing strategy, such as a series of partial phonic responses to the word, only to end up having to tell the child what the word was after the child had gone through several erroneous responses.

During the observation phase of the study, the investigators talked with teachers about their reading group activities and individual work with children. When asked about their cueing behaviors during oral reading, teachers frequently replied that they used these occasions to teach or reteach basic word attack

Table 1

Classification of Teacher Cues

Category		Examples
1	No feedback to error	
2	Negative feedback; Prompting attention	"That's backwards. Start sentence over." Question: What is the word?
3	Praise and encouragement	
4	Context; hint at meaning	Repeats and leaves blank; It means the same as . . .
5	Structural Analysis	Put the two words together. Tells or spells part of word.
6	Phonic	Rhyming with. It's o not i. It ends in e.
7	Tells	Pronounce all of word or completes word
8	Spells	-

skills. In fact, one of the justifications given for the basic pattern of taking turns during oral reading was that it provided a good opportunity for such individual attention. At the same time that teachers expressed the opinion that their cueing of oral reading errors was pedagogically important, they expressed dissatisfaction with their professional training in such skills. In fact, it was commonly pointed out that no emphasis whatever had been placed on face-to-face interactive skill patterns for reading instruction in either pre- or inservice training.

As a consequence of teacher interviews and these preliminary observations of teacher-pupil interactions in reading instruction the researchers decided to explore the feasibility of an experiment aimed at discovering a basis for training teachers in cueing strategies for reading instruction with mildly retarded children. The next step in this exploration was to examine the research literature on reading and information-processing by mildly retarded children to determine empirical and theoretical grounds for devising an experimental cueing strategy.

A number of reading theorists have stated that in order for a child to become a proficient reader he must be able to attend carefully to the distinctive stimulus properties of letters and words (Kinsbourne, 1970; Spache & Spache, 1973). These theorists believe that careful attention to learning these properties during the early years of reading instruction will help enhance the child's ability to correctly identify new words.

Evidence from more than a decade of experimentation with children's discrimination learning strongly suggests that mentally retarded children, in particular, have difficulty in acquiring a set to attend to distinctive cues in discrimination learning (Terdal, 1967; Zeaman & House, 1963). Since the reading process does entail discrimination learning, it seems likely that retarded children may fail to retain important stimulus properties of letters and words because of their attentional deficits.

Of course, learning to recognize and attend to the distinctive properties of letters and words is not a task which requires only a high degree of attending behavior by the retarded child. In describing how a retarded child learns to discriminate the properties of letters and words, processes such as mediation and concept attainment must also be considered. Nevertheless, in view of the apparent importance of attention in early reading of retarded children, the investigators decided that teacher interactive strategies that helped the child to focus on relevant cues in reading were especially critical.

Developing the Rationale for the Experiment

In order to develop a cueing strategy that would incorporate certain principles of learning and that would easily apply to the instruction of retarded children, the investigators constructed and pilot tested a number of different techniques. Each strategy was tried out with three intermediate-level special classes for mildly retarded children in the same school system in which the experiment was eventually carried out. During this formative period the teachers of these classes

observed one of the investigators carry out trial techniques with a few children and tried them out themselves. This pilot phase with experienced classroom teachers enabled the investigators to evaluate the practicality and appropriateness of various techniques and to collect preliminary observations on children's responses to each approach.

After several weeks of pilot investigation, a five-stage cueing strategy was decided on. This strategy incorporated and interrelated teacher behaviors that emphasized attention in visual discrimination, auditory discrimination, and the use of meaningful context for words that give a child difficulty. The resultant strategy consisted of the following steps:

1. When the child comes to a word and shows by hesitation or other behavior he cannot read it or makes an erroneous response to the word (pronounces another word, utters a nonword, utters an incorrect word fragment, or mispronounces the word), the teacher must immediately pronounce the word clearly and with a natural intonation that fits into the context of the passage being read.

2. The teacher next rereads the sentence up to and including the cued word. (If the word comes early in a sentence, the teacher first rereads the preceding sentence).

3. The teacher tells the child to hold a frame card under the cued word so as to set the word off from surrounding words. The frame card is a 2½ x 3-inch plain white card with a small rectangular section cut out along one of the longer edges to accommodate any word occurring in the passage.

4. As the child holds the frame card on the word, the child says the word out loud.

5. All of the other children in the group point to the cued word and say it out loud together.

At the end of the fifth step, the child continues to read aloud.

The Experiment

Overview

The experiment was designed to compare the effects of the five-step cueing strategy with those obtained when teachers responded to pupil errors in their normal fashion. Eight representative intermediate classes for educable mentally retarded children were selected in a large Midwest public school system. Each teacher taught a group of five children in two oral reading lessons, first in the control condition, then using the new cueing technique. The reading selection used in each lesson was a high-interest story, written by one of the investigators to provide a highly controlled vocabulary at a 1.6 grade level. The children taking part in the lesson were randomly selected from a pool of children identified by a screening test as readers whose word recognition level was approximately at grade 1.5. Twenty-four hours after the lesson, each child was tested by reading the entire story aloud to one of the investigators, who made a record of each error. Subsequently, six additional classes were selected to go through the experimental condition.

Subjects

The classes from which the children were selected were located in representative school districts of a large Midwestern city, a majority being lower to lower middle-class districts. The teachers represented a wide range of experience in teaching EMR children, most of them having more than three years of experience. The

teachers were all female.

The 70 children taking part in the study included 44 males and 26 females between the ages of 9 years, 9 months and 13 years, 10 months whose errors on a screening test (see Table 2) fell between 6 and 10. The mean IQ of the sample was 73.5. Approximately 70 percent of the children were black and 30 percent white. When the original control groups were scheduled to go through the experimental lesson a week to 10 days later ("Experimental 1"), a few of the original children were absent. They were replaced by other children selected at random from the pool of children in that class who had qualified on the screening test. Table 2 summarizes the characteristics of the subjects in each group. (The columns headed X_1 and X_2 give error rates measured on the child's initial performance in reading a passage from the story. This will be discussed further below.)

Screening Test

All of the subjects were selected for the experiment on the basis of their performance on a preliminary screening instrument. This instrument consisted of 20 vocabulary words extracted from the Bank Street Reading Series, books 1 and 2, the series used in all classes. Seventy-five percent of the words were drawn at random from the first-year readers while the remaining twenty-five percent of the words were drawn at random from the second year reader (see Appendix A).

A subject qualified for the experiment if he incorrectly identified from 6-10 words. Preliminary pilot testing revealed that the

Table 2

Group Means and Standard Deviations
(Five children per group)

Group		IQ	Screening Test (Errors)	X_1	X_2
Control (n = 8)	$\overline{X}$	70.87	8.35	8.77	14.72
	SD	3.70	1.29	3.81	7.07
Experimental 1 (n = 8)	$\overline{X}$	70.90	8.32	10.50	19.65
	SD	3.50	1.68	3.22	8.63
Experimental 2 (n = 6)	$\overline{X}$	68.83	6.83	5.46	10.40
	SD	4.70	.42	2.64	5.23

X_1 = Posttest Passage Errors, Harris-Jacobson Words only

X_2 = Total Pretest Passage Errors

subjects who missed from 6-10 words on the screening test were the most appropriate for the experiment. These subjects had some knowledge of elementary level reading words and therefore would have a high probability of getting some of the words of the study correct and would not become totally frustrated by missing a high percentage of the words. In addition, these subjects would probably miss enough of the words in the reading story so that an appropriate amount of teacher cueing could be implemented. From each of the separate classes, five subjects who initially met the criterion on the screening instrument were randomly selected from all qualifying children within each class for participation in the experiment.

Lesson Materials

Two stories were written using vocabulary words from the Harris-Jacobson (1972) reading vocabulary list. This list consists of a sample of sight vocabulary words extracted from a number of basal reading series at the primer, first, and second-grade levels. One story was titled "A Real Adventure," an account of two children's trip to the zoo. The second story was titled "The Case of the Missing Baby," a story of what happened to a baby whose parents lost him (see Appendix B). Each story was written in five one-page sections. Each page was approximately 60 words long and each contained exactly 20 words from the Harris-Jacobson list.

After each story was constructed, the Spache Readability Formula (Spache, 1958), a measure of vocabulary level, was applied to the lesson material. The resultant readability level for "A

Real Adventure" was 1.6. For "The Case of the Missing Baby," the readability level was 1.7. The equivalence of the two stories is further indicated by the fact that the pretest error rates for the two stories (Table 2) were not significantly different.

Procedure

A deliberate effort was made to make the experiment as natural a situation as possible for the teachers and children. The teachers were informed of the purpose of the study and told that they should conduct the reading activity in a manner as close to the usual reading group procedure as possible. This meant that in most cases the five children sat around a small table with the teacher. In some cases the teacher arranged chairs in a circle with no table. In one class the teacher and children sat in a circle on the floor in a carpeted corner of the classroom set aside for reading and discussion groups. Children were informed that the investigators were interested in how children went about reading.

A stereo tape recording was made of each lesson and a sampling of lessons in both experimental and control conditions was video-taped. Each class was assured that the recordings were only for purposes of getting an accurate record of what transpired. Children were told they could listen to and view the tapes after the lesson was over.

For both the control and experimental conditions, each teacher received a letter (Appendix C) at least a day ahead of time explaining the procedure to be followed. Teachers in the control condition were asked to make their normal responses to a child when he made an

oral reading error. Teachers were also asked to warn the children in the reading group not to call out words or correct another child when the child made a reading error during his turn.

Teachers in the experimental condition received a detailed explanation of the five-step attentional cueing technique (Appendix C). A practice test was placed at the end of the written training document to enable the teacher to check on the procedure. Prior to each lesson, one of the investigators spent a few minutes with the teacher reviewing the procedure and making sure, by means of a brief roleplay practice, that the teacher understood the procedure.

Just before the lesson began, the teacher was asked to have each child read in turn, starting with the child seated to the teacher's right and proceeding counter clockwise.

During the lesson, one of the investigators took those children in the class who were not participating in the lesson to another location (usually another room or outdoors to the playground) for a supervised activity. The lesson itself was observed by one of the investigators or an assistant who kept a record of individual reading errors and teacher cues.

Testing Procedures

During the lesson (and from the tape, for rechecking), an accurate record was made of each error made by each child during his turn at reading aloud. This was the "pretest" measure. On the following day, each child was tested individually by one of the examiners in a secluded location outside of the classroom. The child was given a copy of the story from the previous day's lesson and asked to read

the entire story aloud. Whenever a child made a reading error, the experimenter recorded it on a record sheet (Appendix D). Children were given only the minimal amount of help from the tester in order to get through the entire story.

Audiotapes of each lesson were subsequently analyzed to determine the types of errors made by the children and, for the control condition, the teacher cueing behaviors were categorized using the coding system described earlier (Table 1).

Analysis

The basic dependent measure for the experiment was the total number of errors made on the reading of the total story during the posttest. A one-way repeated-measures analysis of variance was computed on the group means for the eight groups, comparing control and experimental conditions. Differences between the errors made on the individual pages during the lesson and on the posttest were also analyzed in the same design. To compare the six additional experimental groups with the original eight control groups, a one-way analysis of covariance was applied to the posttest error scores for the entire story, using the pretest error scores on the individual reading passage as the covariate.

The pupil errors and teacher cueing behaviors in the control condition were categorized and the relative success of different cueing strategies in the control condition was analyzed. The results of this analysis are presented in a separate report (Lynch & Brady, 1974).

Results

Cueing Responses--Control Group

Under the control condition, teachers manifested a variety of cueing behaviors with varying degrees of success (as measured by the frequencies of correct word identification following a teacher cue.) Table 3 summarizes the types of cues used and the success rates for the eight classes. Teacher responses to pupil errors fell into three main types: single cues--a single hint or prompt that provided the child with information or stimulus for further attempts to identify the word; multiple cue--a string of cues that might or might not be interspersed with pupil responses terminating either in correct identification of a word ("successful") or with the teacher identifying the word for the child ("unsuccessful"); and telling--directly informing the child by pronouncing the missed word. Both single and multiple cues could be judged as "successful" or "unsuccessful" depending upon whether or not they led the child to a correct word identification. If a cue was not successful, the teacher ended up telling the child the word.

Teachers in the control condition appeared to vary considerably in the strategies used. Some teachers used virtually no cues at all, while others used a high number of multiple cues that were often quite complex. Of course, in the case of a noncueing teacher, the child was never given a chance to try to identify a word once he had indicated to the teacher that he could not respond correctly. Whether or not cueing results in better subsequent word recognition

Table 3

Cueing Responses in the Control Condition

		Single Cues		Multiple Cues		Telling
Teacher	Number Errors	Successful	Unsuccessful	Successful	Unsuccessful	
1	102	8	6	5	23	60
2	77	15	10	8	16	28
3	29	7	0	17	5	0
4	20	4	3	3	5	5
5	20	4	3	3	5	5
6	77	9	9	4	3	52
7	91	1	0	0	0	90
8	61	0	0	0	0	61

when compared with the direct telling, noncueing strategy is not known.

Experimental Group

Both teachers and children found the five-step cueing technique easy to follow. In most groups, after the first child had completed his turn and gone through the procedure several times, the children required only minimal prompting in order to follow the five steps. In most cases it soon became automatic. The procedure was followed very consistently by each teacher with less than one percent of the cues deviating from the procedure. Furthermore, teachers did not elaborate or improvise on the procedure by adding explanations or comments about the missed word. Generally, both teachers and children seemed to find the procedure both easy and profitable. Some teachers reported subsequently that they had adopted the technique, or some variant of it, in their reading groups.

Posttest Results

The eight groups that performed in both the control and experimental conditions were compared on two posttest criteria, the total number of errors made by the children when reading the entire story on the posttest and the difference between the passage errors made during the lesson (pretest) and the errors made on the posttest. The means and standard deviations of both measures for the groups are shown in Table 4. The summaries of the one-way repeated-measures design analysis of variance on group scores on each criterion are shown in Tables 5 and 6. On both the total story errors and the differences in passage errors between pretest and posttest, there

Table 4

Mean Total Story Errors and Pretest-Posttest Differences in Passage Errors

Group	Mean Total Posttest Story Errors		Difference Between Pretest and Posttest Passage Errors	
	Mean	SD	Mean	SD
Control (n=8)	48.20	21.71	5.40	3.51
Experimental (n=8)	42.70	17.48	11.58	6.56

Table 5

Summary of Analysis of Variance--
Posttest Story Errors

Source of Variation	Mean Square	df	f Ratio
Trials	136.89	1	8.47*
Error (T)	16.14	7	
Between Groups	409.18	7	
Total	207.61	15	

*p < .05

Table 6

Summary of Analysis of Variance--Differences in Pretest-Posttest Errors
(Repeated measures across groups)

S	MS	df	f
Trials	1,012.68	1	6.11*
Error (T)	165.67	7	
Between Groups	107.15	7	
Total	40.20	15	

*p < .05

is a difference between conditions in favor of the experimental condition significant at the .05 level of confidence.

In the control condition the children in each group seemed to have benefited somewhat from the lesson. This was reflected in the improvement in word recognition when they read the passage on the posttest. The average reduction in passage error was 40 percent, with a range from 16 percent, for the teacher whose cueing apparently was least successful, to 64 percent for the most successful group. By contrast, the average reduction in errors in the experimental condition was 58.6 percent, the range being 29 to 81 percent.

Six additional classes went through the experimental condition only, using the "A Real Adventure" story. A comparison of the means and standard deviations of this group with the original eight control groups is shown in Table 7. A one-way analysis of covariance, with the pretest passage error scores as a covariate, was performed on the group total story error scores (Table 8). The difference in favor of the experimental groups was significant at the .05 level.

Table 7

Comparison of Control Group and Experimental Group 2

Dependent Variable (X_4)	$\overline{X}$	SD	Covariate (Y) $\overline{X}$
Control (n=8)	48.20	23.20	13.77
Experimental (n=6)	19.63	9.50	15.46

$rX_4Y = .787$

Table 8

Summary of Analysis of Covariance of Reading Study Posttest Scores with Individual Reading Passage Pretest as Covariate

Source	Sum of Squares	df	Mean Square	f Ratio
Between Groups	1885.441	1	1885.441	5.26*
Within Groups	3943.20	11	358.47	
Total	5828.64			

*$p < .05$

Limitations and Conclusions

This experiment suggests that mildly retarded children learn more new words from teacher responses to oral reading errors which provide a highly consistent, structured, attentional form of feedback than when teachers use the normal variety of cueing behaviors. In addition, the study has provided new ways of examining teacher cueing behavior. Both in the pilot work that led to the experiment and in the analysis of process data in the control condition, the investigators have developed new ways of categorizing teacher-child interactions and reading activities. In the process they have acquired some new insights into the possible rationales underlying different interactive strategies commonly in use in the classroom.

A number of substantive and methodological limitations of the study should be pointed out. In the first place, generalizations to practice are restricted because a number of features of everyday practice in reading were necessarily excluded from the study. No emphasis was given to comprehension, either in the directions to the teachers or in any of the criteria used. Undoubtedly some teachers may have found this an unrealistic constraint. And certainly nothing can be said about the relationship of the experimental variables to comprehension processes or outcomes (which the present investigators believe to be highly important, even though they were not within the purview of the present study.)

Another deviation from normal teaching patterns in reading was the fact that neither the teacher nor the children were given a

chance to deal with the story vocabulary prior to the oral reading session. It is more typical that the teacher reviews new vocabulary words before children read a new story. The ensuing teacher cueing behaviors and the children's responses might have differed if this opportunity for preview had been provided.

Two other facts limit the generalizability of the study. First, the intrusion of the experimenters and the recording equipment may very well have altered both teacher strategies and children's responses. Second, the experiment took place late in the spring, not only a traditionally difficult time of year from a motivational point of view, but a particularly difficult time in this school system because of widely expressed distress and morale problems over the effects of desegregation plans under consideration.

Methodologically, the study was limited by a small sample and imperfect experimental control. The wide variance in pretest levels across groups and the variability in teacher behavior in the control condition suggest that any follow-up experimentation should use larger samples. The fact that children had to be drawn from intact groups was, of course, an unavoidable limitation. But the screening test did not succeed in yielding very homogeneous groups, as reflected in large variances in pretest error rates.

It would be premature to draw many implications for practice from this one experiment with a relatively small sample. As is typical in research of this kind, the study has raised more questions than it has answered. First, the experimental cueing strategy,

while based on a research-supported rationale, is complex. If it really should prove to succeed better when used in practice, the reasons for such success remain obscure. It is tempting to conclude that the attentional quality and the redundancy of relevant information conveyed to the child might account for its success. But there are many other plausible interpretations. The sheer consistency of teacher response may be an important feature. Whether the technique enhances visual or auditory discrimination or some associational process cannot be determined. And, of course, the sheer effect of novelty cannot be ruled out.

Several tentative conclusions seem warranted. First, it would appear that elaborate multiple cueing strategies that involve the mildly retarded child in laborious discovery or problem-solving processes are probably not very fruitful and may prove to be frustrating. From the point of view of efficient use of instructional time, a straightforward, direct strategy that informs a child of the word that gives him difficulty while he gives attention to the word and its context probably yields better results as far as subsequent ability to identify the word is concerned.

Next Steps

Two general lines of inquiry seem appropriate in following up this experiment. One line should be directed toward illuminating in greater detail the effectiveness of differential cueing strategies in teaching reading to mildly handicapped children. The other is to

probe, in greater depth, other teacher strategies for helping children cope with learning situations that involve discriminating stimulus information and that call upon attentional processes.

Further research is planned to identify critical interactive reading skills of teachers. In addition to partially replicating the present study this research will experimentally compare a greater variety of cueing strategies, using more sophisticated criteria and building in better experimental control. Because of the importance of teacher skills in adapting instruction to individual child characteristics, the investigators are considering adding information on children's reading characteristics to the design as a basis for building in decision processes for matching cueing strategies to child characteristics.

Defining the master teacher's repertory of basic, generic interactive skills remains an important challenge. Undoubtedly there are other learning tasks facing children in school in which attention to cues can be reliably guided by teacher strategies. Defining such generic skills and designing validated training materials for their development is a major goal of this Center.

APPENDIX A

Preliminary Screening Instrument

Listen. Look. Read. Draw a line.

Listen very carefully. I will say one of the words in each box. Underline the word I say. Example: Underline the word "run" in the first box.

run rub ran rank	hot hat hit hut	saw was say she	skip slip snap snip	spell skill spill swell
three third thrill thread	thank thing think tank	have help here has	wake wall walk work	drive drove bride bribe
head ahead long along	more must many made	shout shoot should shook	course curse cure could	than them then these
flapping flipping flopping floating	sage cage cages sages	blue black blend blond	differ differed different difficult	faster fatter falter father

APPENDIX B

Lesson Materials

THE CASE OF THE MISSING BABY

1

Once upon a time, a baby boy was left in the woods by his mother and father. Before his parents went, they built a small fire so that he would be warm. Soon after the parents had gone, four hunters saw the smoke. As they began to come close to the fire the men could hear the baby cry.

They found the baby under an Oak tree on top of a little hill. The baby was hungry and drank all of the milk one of the men had. The men had to speed to town on the old road so they could find out news about the tiny baby's family. Once they were in town, the men told their story to the police and a man from the TV station.

3

Two weeks went by and not one clue was turned up. The men knew that something had to be done with the baby or he would be put in a home for children that had no family. After having a talk with his family, one man said that he would be glad to raise the baby as his own. The next morning the man and baby took an early ride far into the country.

Along the way, they stopped for a bite of food and something to drink. On the wall of the diner there was a copy of a letter. It read: "If anyone comes across a baby covered in a yellow towel left in the woods - we want him back. Also, you must take good care of him because he gets sick quite a bit."

5

At first the man was sorry because he was sure the baby would have to return to his real parents. The man was in a hurry to get the baby home and took him there right away. As they came close to the baby's home he could see two people stand on the porch and wave. The family was full of joy and lucky to have their son back, and when his parents finally saw him he was sound asleep.

A REAL ADVENTURE

1

Mary woke up happy when the morning birds sang. Today was her birthday and there would be a trip for Mary and her sister Sally. They were going to the Seventh Street Zoo and did not lose one minute getting ready. They got on the train near their house and away the girls went.

On the train, they found a book which had animal pictures in it. It was a surprise to them that they could name the animals at first glance. At the zoo, the two girls bought peanuts, popcorn and a huge red balloon. The girls saw a prize pony, a turtle, a red fox, and a duck with two feet and a brown bear.

3

It began to rain and drops of water got on Sally's dress and shoes. They could not stay at the zoo for the afternoon and they were very angry. All of a sudden, the sky seemed to open and the bright sun came through the sky. The warm sun made the girls feel good and they began to make plans for tomorrow.

4

When the girls were about to climb on the train, an old woman stopped to talk to them. Hello, where have you young ladies been on a dark day like today? Oh, the girls said, we were at the zoo where we saw more animals and people than we have ever seen before. The woman began to laugh and told the girls that she wished she was young again.

5

That night in the kitchen the girls told their mother and brother about the zoo. They asked for extra money so they could visit the zoo at another time. The girls' mother said, "maybe when school is out you can go back to the zoo but for now you cannot." Please let us go soon so we do not forget what the zoo looks like!

APPENDIX C

Letters to Teachers in Control and Experimental Conditions

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

We are grateful to have the opportunity to evaluate our training materials with you. The main purpose of our work is to validate various techniques in the teaching of sight vocabulary words to mildly handicapped children.

Procedure.

First, the children whom we selected from the screening test will take part in an oral reading lesson with you. A story will be presented that contains words that the children may or may not have seen before. Each child in the reading group is to read out loud one page of the story. Each page consists of four sentences. Because we are interested in the children's reaction to this material while you are teaching them, simply conduct the oral reading lesson as you normally would. However, please make sure that when a child is reading the other children do not call out words or correct the child when he misses a word.

The reading lesson will be tape recorded.

Second, on the day following the reading lesson we shall test each child individually to find out how many words he recognizes. The children should not be told ahead of time that they will be tested.

Preparing Your Class.

You may explain to the class that we are interested in finding out how children learn words in a new story.

If possible, we would like to conduct the reading group in a section of the classroom that is not too noisy. A table in a corner (preferably near an electrical outlet) would be ideal.

If you prefer, one of the people from Bloomington will have seatwork activities prepared ahead of time for the remainder of the class not involved in the study. This is totally optional and will only be used with your expressed permission.

At the beginning of the lesson say something like this to the group: "Read this paragraph about A Real Adventure out loud as well as you can. Don't be afraid of it. Each of you will have a turn to read. Keep reading until I tell you to stop. Remember, don't call out a word if another child misses it unless I ask you to."

Extreme Case.

If, by some chance, a child has so much difficulty with the first sentence of his page that he requires help on just about every word, help him through the remainder of the page by reading the remaining sentences yourself, pausing occasionally at words you think he'll know and asking him to read them. But only do this in case a child has the most extreme difficulty with almost all of the words.

We shall let you know how this comes out once we have analyzed the results from all of the classes.

Many thanks.

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
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We are grateful to have the opportunity to evaluate our training materials with you. The main purpose of our work is to validate various techniques in the teaching of sight vocabulary words to mildly handicapped children.

Procedure.

First, the children whom we selected from the screening test will take part in an oral reading lesson with you. A story will be presented that contains words that the children may or may not have seen before. Each child in the reading group is to read out loud one page of the story. Each page consists of four sentences. We are interested in how children respond with the technique described in the accompanying document. It is an experimental technique for cueing the child when he has difficulty with a word. Other than using the cueing technique as described, please conduct the lesson in as normal a fashion as possible. However, please make sure that when a child is reading the other children do not call out words or correct the child when he misses a word.

The reading lesson will be tape recorded.

Second, on the day following the reading lesson we shall test each child individually to find out how many words he recognizes. The children should not be told ahead of time that they will be tested.

Preparing Your Class.

You may explain to the class that we are interested in finding out how children learn words in a new story.

If possible, we would like to conduct the reading group in a section of the classroom that is not too noisy. A table in a corner (preferably near an electrical outlet) would be ideal.

If you prefer, one of the people from Bloomington will have seatwork activities prepared ahead of time for the remainder of the class not involved in the study. This is totally optional and will only be used with your expressed permission.

Renearse the technique in your imagination a few times before the time of the lesson. If you can find an opportunity to try it with someone (not one of your pupils) ahead of time, it might help. It is important to use the technique easily and not hesitate because you are unsure of what to do next.

Extreme Case.

If, by some chance, a child has so much difficulty with the first sentence of his page that he requires help on just about every word, help him through the remainder of the page by reading the remaining sentences yourself, pausing occasionally at words you think he'll know and ask him to read them. But only do this in case a child has the most extreme difficulty with almost all of the words.

We shall let you know how this comes out once we have analyzed the results from all of the classes.

Many thanks.

Cueing by Focused Attention

In teaching the experimental oral reading lesson, we hope to find out the effects of helping a child with a difficult or unfamiliar word by a simple technique of focusing the child's attention on the word and giving her/him a chance to hear the word several times in the context of the sentence.

The Technique.

The technique has five steps that should always be followed as smoothly and automatically as possible when a child cannot read a word in the oral reading situation.

Step 1. When the child comes to a word and, by a hesitation or other behavior, gives a clear sign that s/he cannot read the word, you should immediately pronounce the word clearly and with a natural intonation that fits the context.

Step 2. Make sure the child is holding the frame card under the word so as to frame the word.

Step 3. Reread the sentence up to and including the cued word. If the word comes early in a sentence, reread the sentence that came before, plus the words preceding the cued word.

Step 4. Ask the child to repeat the word.

Step 5. Ask the rest of the group to point to and to repeat the word.

The Principle.

Children attend to many different things when reading. The child who has difficulty with reading (either because his reading is very immature or because he has particular problems in learning with the printed word) may be attending to the wrong cues and hence may learn with greater difficulty. For example, you may have noticed that some children in a reading situation are very distractible, often taking their cue from other children or being overly dependent upon your help with new or difficult words. Some children guess wildly (and successfully). Some children give up to easily and won't try.

It seems reasonable that it would help to combine a technique that encourages the child to focus his visual attention on the word, with an emphasis on the meaningful context and the sound of the word itself. By simplifying the situation for the child, it makes it possible for him to use whatever deciphering skills he has developed to better advantage. At the same time, having this experience may help the child extend his/her repertory of deciphering skills on his/her own.

The use of the frame card is intended as a temporary device to help the child look more carefully at the word and hence attend to it as he hears the context and hears and says the word. While the child looks at the word, the teacher clearly rereads the immediate context and repeats the word. The child says the word and listens to the others in his group say it. All of this is done smoothly, without breaking the flow of the story and without making "a big deal" about reteaching the word.

Suggestions.

1. Try to follow the procedure as smoothly and naturally as possible.

2. Reward the child for correct rereading by saying "Good!" or "Fine." This helps to emphasize the positive and keeps children from feeling that repeating the word with the frame card is a penalty for missing the word.

3. In the rare case that a child still cannot say the word in step 4 or 6, help him out by repeating the word in a tone that implies that he knows it and just needs a little help.

4. If the passage is much too difficult for a child, read parts of it for the child and use the cueing technique with two or three words in each sentence that you feel are words that the child can master. Use this only in the extreme case of a child who needs help on almost all of the words on the page.

To be sure that you understand the technique thoroughly and will be able to follow it easily in the lesson, review the steps by reacting to the following.

1. When it becomes apparent that a child cannot read a word, then I should first _____.

2. Before I reread the part before the missed word, the child should _____.

3. The reason for rereading the part that includes the framed word is _____.

4. After the child hears me reread the part with the framed word, s/he should _____.

5. Before continuing with the page, the child hears the word again from _____.

KEY

1. pronounce the word for the child.

2. frame the word with the card.

3. to provide the child with the meaning context of the word he missed.

4. repeat the word.

5. the rest of the group.

APPENDIX D

Sample Record Sheet

The Case of the Missing Baby

Once upon a time, a baby boy was left in the woods by his mother and father.

Before his parents went, they built a small fire so that he would be warm.

Soon after the parents had gone, four hunters saw the smoke.

As they began to come close to the fire the men could hear the baby cry.

They found the baby under an Oak tree on top of a little hill.

The baby was hungry and drank all of the milk one of the men had.

The men had to speed to town on the old road so they could find out news about the tiny baby's family.

Once they were in town, the men told their story to the police and a man from the TV station.

Two weeks went by and not one clue was turned up.

The men knew that something had to be done with the baby or he would be put in a home for children that had no family.

After having a talk with his family, one man said that he would be glad to raise the baby as his own.

The next morning the man and baby took an early ride far into the country.

Along the way, they stopped for a bite of food and something to drink.

On the wall of the diner there was a copy of a letter.

It read: "If anyone comes across a baby covered in a yellow towel left in the woods--we want him back.

Also, you must take good care of him because he gets sick quite a bit."

At first the man was sorry because he was sure the baby would have to return to his real parents.

The man was in a hurry to get the baby home and took him there right away.

As they came close to the baby's house he could see two people stand on the porch and wave.

The family was full of joy and lucky to have their son back, and when his parents finally saw him he was sound asleep.

A Real Adventure

Mary woke up happy when the morning birds sang.

Today was her birthday and there would be a trip for Mary and her sister Sally.

They were going to the Seventh Street Zoo and did not lose one minute getting ready.

They got on the train near their house and away the girls went.

On the train, they found a book which had animal pictures in it.

It was a surprise to them that they could name the animals at first glance.

At the zoo, the two girls bought peanuts, popcorn and a huge red balloon.

The girls saw a prize pony, a turtle, a red fox, and a duck with two feet and a brown bear.

It began to rain and drops of water got on Sally's dress and shoes.

They could not stay at the zoo for the afternoon and they were very angry.

All of a sudden, the sky seemed to open and the bright sun came through the sky.

The warm sun made the girls feel good and they began to make plans for tomorrow.

When the girls were about to climb on the train, an old woman stopped to talk to them.

Hello, where have you young ladies been on a dark day like today.

Oh, the girls said, we were at the zoo where we saw more animals and people than we have ever seen before.

The woman began to laugh and told the girls that she wished she was young again.

That night in the kitchen the girls told their mother and brother about the zoo.

They asked for extra money so they could visit the zoo at another time.

The girl's mother said maybe when school is out you can go back to the zoo but for now you cannot.

Please let us go soon so we do not forget what the zoo looks like!